

The Future of Mine Countermeasures

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## Report Documentation Page

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Mines are extremely effective weapons. They are small, cheap, easy to hide, easy to store, and can be clandestinely laid from virtually any type of platform. They have quickly become the favorite weapon of informal forces, such as terrorists, and have been used by formal forces to protect and disrupt the coastline, as seen in Operations DESERT STORM and IRAQI FREEDOM. With the development of new concepts by the Marine Corps, such as Expeditionary Maneuver Warfare (EMW), Operation Maneuver from the Sea (OMFTS), Ship-to-Objective Maneuver (STOM), and Over-the-Horizon (OTH) movements, mine countermeasures (MCM) have been brought to the forefront quickly in order to be able to conduct these future concepts. New technology to aid and execute these concepts, such as the MV-22 Osprey and the Expeditionary Fighting Vehicle (EFV), are in the final stages of testing. With the mine threat today and new mine technologies, the question is: Does the Marine Corps have a Forcible Entry Capability?

### **Background**

The Navy is responsible for MCM missions in Deep Water (DW) (> 200'), Shallow Water (SW) (40'-200'), Very Shallow Water (VSW) (10'-40'), and the Surf Zone (SZ) (< 10'), which includes the High Water Mark (HWM). The Marine Corps is responsible for MCM mission from the HWM to the Beach

Zone (BZ) and the Beach Exit Zone (BEZ). The problem areas for the Navy are the VSW and the SZ because the MCM capabilities are inadequate due to the breaking and plunging waves that make this area "noisy and nearly opaque to both acoustics and optics."<sup>1</sup> As depicted in the graphical representation of a littoral region, in appendix A, the SZ and VSW require the need to put humans and mammals into the water, which is a sever hindrance in detecting the mines due to the violent nature in this area. Once the mines are detected, they then need to be neutralized and obstacles reduced.

The Marine Corps depends upon the Navy to field the family of systems required to detect and avoid (when possible) or breach (when necessary) Very Shallow Water (VSW), Surf Zone (SZ), and Beach Zone (BZ) mines and obstacles. In amphibious operations, the Navy is responsible for conducting MCM operations from the stern gate through the beach exits,<sup>2</sup> allowing the MAGTF to build adequate combat power ashore. Landing beaches that are fouled by mines and obstacles render the operation difficult at best due to the limited airlift and surface maneuver space.

The want of adequate MCM capabilities has adversely impacted recent Naval Operations. During Operation DESERT STORM, the 4<sup>th</sup> Marine Expeditionary Brigade (MEB) was relegated to a deception role due, in large part, to the U.S. Navy's inability to breach Iraqi very shallow water, surf zone, and beach zone mines

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<sup>1</sup>. Ocean Studies Board, National Research Council. Oceanography and Mine Warfare: 2000, 39.  
<sup>2</sup>. United States Marine Corps Mine Countermeasures (MCM) Master Plan (Draft), January 2004, 4.

and obstacles. Even if the 4<sup>th</sup> MEB had been delivered ashore, it is doubtful that the MEB's MCM capabilities would have been adequate to overcome the Iraqi integrated defensive barrier plan.<sup>3</sup>

With this being stated, the push is on to develop a system of MCM capabilities that will fill the gaps.

### **Near-Term Solutions**

Near-Term solutions are defined as MCM capabilities that will fill the gap from present to about 2010 until better technologies and weapons systems come online. With minefield detection still lagging behind, a breaching capability might be just around the corner. Using existing technology and commercial-off-the-shelf (COTS) systems, an Assault Breaching System (ABS) may be fielded as soon as 2006.<sup>4</sup> This will allow military forces to conduct surf zone, beach zone mine and obstacle standoff breaching. The cancellation of the shallow water assault breaching (SABRE) and distributed explosive technology (DET) systems (similar to the line charge and deployed from LCAC's), new systems are being developed with more standoff. The Office of Naval Research exploited existing precision guided (JDAM) (MK-84) bombs (blast warhead) to be delivered by either

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<sup>3</sup> . Mine Countermeasures (MCM) Master Plan (Draft), 4.

<sup>4</sup> . Giese, Mark, Major, USMC. Personal Interview. 9 Jan 2004.

Naval TACAIR or United States Air Force Bombers, with technology being developed to also use Naval Gunfire.<sup>5</sup> With a Memorandum of Agreement in the process of being signed by the Air Force to take this mission, testing is being conducted with promising results.<sup>6</sup> The system is readily compatible with the JDAM logistics support system with zero lift required from the Amphibious Ready Group or Expeditionary Strike Group. The system is easily integrated into the Navy and/or Air Force direct attack Concept of Operations. It uses innovative delivery and detonation control to efficiently breach assault lane threats of proud (surface laid) mines and light obstacles in the surf and beach zones.<sup>7</sup> This existing technology is being referred to as the Joint Assault Breaching System (JABS).

### **Far-Term Solutions**

Far-Term solutions are defined as detection and weapon systems that will fill that gap from 2010 to 2015 and beyond. These systems are more technologically advanced and breach the surf and beach zones. The Standoff Delivery System (STODS) is much like the JAB system except the warhead contains approximately 6,400 darts that are

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<sup>5</sup> . Office of Naval Research. Near-Term ABS S&T Program. Power point brief, slide 3.

<sup>6</sup> . Giese. Personal Interview

<sup>7</sup> . Giese, Mark, Major, USMC Near-Term Surf/Beach Zone Requirements, MCCDC Information Paper. 6 January 2003, 1

dispersed at a certain height and penetrate the surf and beach zone to neutralize the mine. The darts can penetrate up to four feet of water and travel at a speed of 910 feet per second.<sup>8</sup> The countermine effectiveness is about 36 rounds to clear ninety percent of the mine belt (fifty yards long) and the counter obstacle effectiveness is about 12-14 rounds to clear ninety percent of the obstacle belt.<sup>9</sup>

Another development for the far-term is the surveillance and detection capability in the surf and beach zone. The Rapid Overt Airborne Reconnaissance (ROAR) can be operated during the day and at night. This unit is deployed in a helicopter and can cover eight sq nm per hour, at a max depth of forty feet and minimum depth of four inches of water.<sup>10</sup> This system, along with other detection methods, will hopefully remove the human and mammal presence from the SZ and VSW areas.

### **Conclusion**

The advent of STOM, allows for avenues of approach other than the beach. One option is to gain a quick foothold on a key piece of terrain by air until other combat power arrives. However, if the other combat power is

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<sup>8</sup> . Northrop Grumman. OMCM FNC Guideline Study Workshop, System Book: Power Point brief slide 23.

<sup>9</sup> . Northrop Grumman. Power Point brief slide 23.

<sup>10</sup> . Northrop Grumman. Power Point brief slide 17.

located on Amphibious shipping, the quick foot-hold quickly becomes untenable. While moving to another beach or littoral area is an option, this might become a problem if the landing force has to conduct long movements with little or no logistical capability.

With new technology for breaching the surf and beach zone, being discovered everyday, detection is still the sticking point in MCM operations. A detection system needs to be in place in order to breach and neutralize the mines and obstacles. Currently, there are no breaching or detection systems in place for MCM operations. As mines become buried in the ever changing surf zone, so has the current MCM doctrine. The near and far term solutions will enhance future operations in the littoral regions, but as of now we do not have a forcible entry capability in the Marine Corps. Should the Navy be single tactical commander responsible for mine and obstacle breaching up to the beach exit point? Should the Marine Corps move in to take the surf zone? Just some questions that need to be answered by 2015 in order for the Marine Corps future concepts to work.

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## Outline

### The Future of Mine Countermeasures

- I. Intro
- II. Background
- III. Near-term mine countermeasures
  - A. COTS
  - B. Air Force
- IV. Far-term mine countermeasures
  - A. Neutralization of mines
  - B. Detection
- V. Conclusion



# Appendix A

## Naval MCM Requirements and Capabilities

